

THAT WHICH IS CLAIMED:

1. A process for the production of previtamin D, the process comprising:  
a first irradiation of a reaction mixture containing provitamin D  
5 with light energy having a wavelength of approximately 254 nm; and  
a second irradiation of the reaction mixture with light energy  
having a wavelength of approximately 313 nm.
2. The process of claim 1, wherein the first and second irradiations are  
10 sequential.
3. The process of claim 1, wherein the reaction mixture further contains a  
solvent.
- 15 4. The process of claim 1, wherein the reaction mixture further contains  
an organic solvent.
5. The process of claim 1, wherein the reaction mixture further contains  
methanol.  
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6. A process for producing previtamin D, the process comprising  
irradiating a reaction mixture containing provitamin D with light energy having  
a wavelength of approximately from 240 to 265 nm and with light energy  
having a wavelength of approximately from 300 to 330 nm.  
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7. The process of claim 6, wherein the first and second irradiations are  
sequential.
8. The process of claim 6, wherein the reaction mixture further contains a  
30 solvent.

9. The process of claim 6, wherein the reaction mixture further contains an organic solvent.
10. The process of claim 6, wherein the reaction mixture further contains  
5 methanol.
11. A process for producing previtamin D, the process comprising irradiating a reaction mixture containing tachysterol with light energy having a wavelength of approximately from 300 to 330 nm.  
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12. The process of claim 11, wherein said wavelength consists of 313 nm.
13. The process of claim 11, wherein the reaction mixture further contains a solvent.  
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14. The process of claim 11, wherein the reaction mixture further contains an organic solvent.
15. The process of claim 11, wherein the reaction mixture further contains  
20 methanol.
16. A method of estimating the progress of the process of Claim 11, the method comprising:  
determining ultraviolet absorption spectra for provitamin D,  
25 previtamin D, vitamin D, lumisterol, and tachysterol;  
monitoring the ultraviolet absorption spectrum for the reaction mixture; and  
estimating progress of the process by applying singular value decomposition analysis to the monitored ultraviolet spectrum of the

reaction mixture compared to the ultraviolet spectra for provitamin D, previtamin D, vitamin D, lumisterol, and tachysterol.

17. The process of claim 20, wherein the ultraviolet spectra are measured  
5 using light energy having wavelengths from approximately 230 nm to approximately 340 nm.
18. A process for production of vitamin D, the process comprising:  
a first irradiation of a reaction mixture containing provitamin D  
10 with light energy having a wavelength of approximately 254 nm;  
a second irradiation of the reaction mixture with light energy  
having a wavelength of approximately 313 nm; and  
heating the reaction mixture after the second irradiation.
- 15 19. The process of claim 18, wherein heating consists of a temperature not exceeding 100° C.
20. The process of claim 18, wherein the first and second irradiations are sequential.  
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21. The process of claim 18, wherein the reaction mixture further comprises a solvent.
22. The process of claim 18, wherein the reaction mixture further  
25 comprises an organic solvent.
23. The process of claim 18, wherein the reaction mixture further comprises methanol.
- 30 24. A process for production of vitamin D, the process comprising:

a first irradiation of a reaction mixture containing provitamin D with light energy having a wavelength of approximately from 240 to 265 nm;

5 a second irradiation of the reaction mixture with light energy having a wavelength of approximately from 300 to 330 nm; and heating the reaction mixture after the second irradiation.

25. The process of claim 24, wherein heating consists of a temperature not exceeding 100° C.

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26. The process of claim 24, wherein the first and second irradiations are sequential.

27. The process of claim 24, wherein the reaction mixture further  
15 comprises a solvent.

28. The process of claim 24, wherein the reaction mixture further comprises an organic solvent.

20 29. The process of claim 24, wherein the reaction mixture further comprises methanol.